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Critical Literature Review
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To whale or not to whale, that is the question

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Abstract (ca. 200 words):

Scientific whaling in the Southern Ocean has been a topical issue through scientific, political, economic, cultural and ethical aspects. Scientific whaling began after the International Whaling Commission (IWC) announced the moratorium on commercial whaling. Many of the main objections and campaigns against the Japanese scientific whaling in the Southern Ocean are related to the Japanese agenda behind their research. This critical review evaluates the four main aspects and their evidence towards the Japanese agenda. There is no significant scientific certainty that the agenda for the Japanese scientific whaling is one to eventually re-establish commercial whaling. Future research is needed to be undertaken by concerned nations to solidify the research being produced and allow management decisions to be made with greater knowledge and evidence.

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Introduction and brief history of whaling in the Antarctic

Whaling in Antarctic has always been a contentious issue. In the early 19th century many of the larger slower whales such as the sperm and hump back whales were hunted for their meat, oil and cartilage (Baker & Clapham 2004). As these whale numbers declined and technology advanced whalers attention turned to the smaller and faster baleen Antarctic minke whale (*Balaenoptera bonaerensis*) (Kock 2007). This targeted whaling of the minke whale only began in 1971 and therefore there stock was not impacted as heavily as the older whaling species targets (Konishi et al., n.d. ,Kock 2007). In 1948 the International Whaling Commission (IWC) was formed, the IWC was made to conserve the whales and manage whaling not to prevent whaling from occurring (Schweder 2001).

In 1982 a moratorium on whaling was agreed upon (Kock 2007). Since this suspension of commercial whaling some of the whale species populations have recovered (Smith et al., 2007). Of the many members of the IWC Japan and the Soviet Union have applied for special permits to hunt whales (Kock 2007). This special permit was the beginning of scientific whaling in 1987 (Kock 2007). Within catch quotas it allows the Japanese fleets to hunt and catch minke whales. In this review the main issue addressed will be is there a reason to halt all whaling in the Southern Ocean. The incentives behind scientific whaling for the Japanese will be discussed, whether the research being undertaken has enough importance to be continued or effective alternatives that could be applied and the effects that this whaling may be having on the ecosystem. This will be completed by comparing opinions on whaling from different nations and groups, comparing the scientific, cultural and ethical, political and economic opinions on this subject.

Scientific Research and Views

Science is important in making management decisions, as stated in Article V of the International Convention of the Regulation of Whaling, where it requires any decisions made to be based on science (Clapham et al., 2007). Scientific uncertainty has played a large role in the management decisions in whaling. To fix this uncertainty the Japanese Special Permit Research on the Minke Whale in Antarctica (JARPA) was set up in 1987 (Report of the Scientific Committee, IWC 43). Permits are given to nations under certain circumstances such as for scientific research purposes after being reviewed by the Scientific Committee (McCloskey 1977). The two main objectives of the Japanese Scientific research programme from 1987/88 to 2004/05 were to estimate age-specific, natural mortality rate and to understand the ecosystem in which the minke whales live (Kasuya 2007). The new program ecosystem objectives remained similar but with greater sample size and, as for the first operation, it would continue for an unlimited period (Kasuya 2007). However, it is not possible to go to any ecosystem and remove a multiple or single species without causing issues, as we have learnt from our past. This is where the precautionary approach is applied, the quotas for this scientific research are calculated and set by the Revised Management Procedure (RMP), these are risk adverse due to the remaining scientific uncertainty and environmental variables (Leaper & Miller 2011, Report of the Scientific Committee, IWC 43).

Japan has received a lot of criticism and pressure form anti-whaling governments, including Japans major trading partners, also from scientific community on the

questionability of the science and of course from NGOs (Iliff 2008). Japan has kept in line with the intention of the IWC by maintaining and promoting sustainable harvesting of the cetaceans, in Antarctica's case mainly the minke whales (Iliff 2008). However even within the IWC there are beliefs that Japan has results that have been predetermined, showing increasing stock for example (Clapham et al., 2007). The reason for a critical evaluation of the Japanese intentions for scientific research whaling is supported by their history in whaling and the true scientific benefits that is received from their research. Papers are being published and data is being collected but this is where alternative study measures and sampling can be applied in many cases to find the information without culling the whales and ensure what they are presenting is not being influenced by alternative agendas (Clapham et al., 2007).

From the data collected it has shown that the number of minke whales being removed is not of significance to the ecosystem and the role they play in it. It is commonly stated that whales are endangered yet this is a wide generalisation. The scientific whaling research in Antarctica supplies the scientific committee of the IWC with data allowing stock assessments of the whale species. These have shown that many species are experiencing a recovery in abundance from when they were harvested, this increase has occurred since the beginning of the moratorium (Leaper & Miller 2011, Morishita 2006). Culling of whales must occur for analysis on stomach content to be completed. A study by Ichii and Kato (1991) of 273 minke whale stomach contents established that krill (*Euphausia superba)* were the main food source, this is also supported by the study of Ichii et al (1998). This has impact on the health of the animals as with climate change sea ice levels are fluctuating, this is the habitat in which krill live, and therefore the minke whale food source also fluctuates. This fluctuation has been identified through the study of blubber thickness. The study completed by Konishi et al (*n.d*.) analysed the historical data from 1987/88 to 2003/04 from Areas IV and V of the blubber thickness of minke whales. Their results showed that over the past few years of the study period the amount of blubber had decreased, possible reasons for this decrease are believed to be a decline in their food stocks from inter and intra specific competition (Konishi et al., *n.d*.). This may be due to the increase in the other baleen whale species as the moratorium helps to rebuild stocks (Kock 2007).

As specified in the Special permit (JARPA), the animals were collected and many measurement were taken. Animals are generally sited in groups or individuals, then only a randomly selected proportion are caught to be analysed in depth. Outer observations are conducted such as body length, dissection allowed for blubber thickness measurements (Konishi et al*., n.d*.). Sex and maturity were also noted and tissue samples observed in the laboratory (Konishi et al*.,n.d*.). This evidence of multiple measurements being taken appears to show a depth within the studies and use of a great proportion of the whale as possible to allow greater analysis. This is requested in Article VIII of the ICRW that there should be full utilization of the whale carcass (Kasuya 2007). The kind of competition believed to be occurring in the food supply and therefore affecting the health of the minke whales needs to be further addressed. This will enable management plans to be amended if minke whales decrease in health and numbers and also see the ecosystem change as top predators become more abundant and greater interactions occur.

Blubber analysis is also used for identifying compounds that are stored in fat such as organotin compounds (Iwata et al., 1994). These compounds, similar to pollutants, increase as they are transferred up the food chain, also known as bio accumulate and are of concern with possible global pollution and change (Iwata et al., 1994). Only 1 -2 grams of whale blubber was used for this analysis yet all of the pinnipeds and cetaceans used in this study , which included minke whales, were caught and killed (Iwata et al., 1994). It is not stated whether or not they were used for other research but under the Article VIII in the ICRW the carcasses of the whales at least should have been used as thoroughly as possible. With this type of analysis in the present day the use of air harpoon guns to remove small amounts of skin and blubber could provide the samples needed (Todd et al., 1997). Age structure of whale populations was conducted in 1987/88 by the Japanese. Sighting surveys were conducted to help estimate population abundance, age however is done thorough the number of lamina on their ear plugs (Kishino et al., 1991). Commercial whaling gave data for the whales ages caught, however this led to bias as they tend to hunt larger whales therefore influencing results (Kishino et al., 1991). By attempting to remove this bias they found their age distribution from the results to be different to that found from the commercial whaling data (Kishino et al., 1991), this is an example of how beneficial independent research can be to ensure reliability and greater certainty of the results found.

In the study by Ishikawa et al (2000) they state that there was specific attention paid to the culling of the whales, in that time of death was reduced through explosive harpoons as the primary killing method and larger calibre rifles were used as secondary method when required. They also completed a survey which noted problems with methods of testing that didn't include culling the whales such as biopsy using an air gun and crossbows. There were issues with wind and the weakness of both instruments also size of the darts not getting great amounts when under the water (Ishikawa et al., 2000), these issues have been addressed and further research has greater capabilities that allows better ability to sample whales (Todd et al., 1997). However humane they may try to do this it is very hard for the public to view it and be accepting.

Alternative methods for studying cetaceans in the Antarctic options include gathering information on their distribution for conservation using aerial surveys from ship helicopters (ice breakers) and digital photography for identification as described by Scheidat et al(2011).The current vessels used for the Japanese scientific whaling due include a dedicated whale sighting vessel and three vessels that catch and sight whales, used in Antarctica and the north Pacific (Kasuya 2007). Greater emphasis on sighting vessels for this identification and biopsy sampling would remove the ethical concerns for killing of the whales. It would allow specimens, for example for the blubber analysis, to be retrieved using a harpoon to remove enough skin and blubber without inflicting too much grief on to the animal. This may show the lack of necessity for whole whales to be killed. However there is no current technique that enables the study of the gut content without dissecting the whale.

Politics in scientific whaling

Politics is believed to be the source of a wide spread anti-whaling movement in the 1980s and 1990s. This was through a time where "Japan bashing" occurred from the United States (US), as Japan began to grow in its influence (Morishita 2006). In

particular in the Western developed countries whales were put on a pedestal and seen as special and something not to be harvested (Morishita 2006). This was supported through historical evidence of over exploitation of some whale stocks and was generalised for all whale species. Historical behaviour of the Japanese government also questions their incentives, they objected to the moratorium as they believed the decision was not based on scientific evidence (Kasuya 2007). Japan lodged legal objections to the moratorium decision for commercial whaling however due to international pressures withdrew the objections (Iliff 2008, Kasuya 2007). These pressures included threats from the US to deny Japan the right to fish in its territorial waters (Iliff 2008). It is obvious they are against the moratorium and restrictions on whaling but international pressure has influenced them before so may prevent the North Alliance form forming due to that same pressure. It is also fair to state that if the whaling nations were very serious on whaling commercially again they would go ahead with their plans to form a parallel convention known as the North Alliance and leave the IWC (Mazzanti 2001). Those anti-whaling nations continue to vote for an entire ban on whaling which is leading to this threat from the pro-whaling nations (Mazzanti 2001).

Another example for their alternate agenda is the fact that the Japanese increased their quota catch in 2005 from 400 to 850 minke whales, and added fin and humpback whales (Gales et al., 2005, Kock 2007). These scientific catches are now on a commercial scale (Papastavrou 2006). It is known that the IWC has no enforcement powers, that the regulations and quotas are the responsibility of each member nation (Mccloskey 1977). The member nations also employ the penalties for their nationals, therefore if there is an alternative agenda it may be influenced by the government themselves. Their attitude with refusal to cooperate with the ICW Scientific Committee on the management of small cetaceans believed to be in population decline may also be an area of concern (Kasuya 2007). From all of this uncertainty in agenda the Australian government is in the process of taking Japan to the International Court of Justice. It is in the Japanese culture to hunt and eat whales and therefore a lot of pessimism surrounds the true agenda of whaling in Antarctica. However they ensure that the whales hunted in the Antarctic are only used for scientific purposes as their permit allows (Morishita 2006). There is questionable evidence to this due to the scientific papers published and studies by Baker et al (2010) that have identified through DNA analysis whale meat in the markets of Japan.

Economics of scientific whaling

Under the idea of scientific whaling there is no longer a direct economic gain for the countries, however there is still NGO and anti-whaling governments that believe this is the disguise of Japans true agenda (Morishita 2006). Japan have come forward to say that meat remaining from their samples does get sold and proceeds go to supporting future research for following years with the rest subsidised by the government (Morishita 2006). This is confirmed by studies that have shown that the whale meat of these whales is being old in Japanese markets (Baker et al., 2010). Article VIII of the ICRW does not permit the whale hunting that can raise funding for research or other political purposes (Kasuya 2007). There are therefore risks of corruption as noted by Kasuya (2007) if the scientists are not given incentives for their scientific research over monetary benefits and political pressures. However Morishita (2006) noted that Greenpeace and other NGOs are groups that gain the most from whaling in terms of an

economic benefit and therefore as stated in the cultures and ethics, from the science provided they can no longer say the whales of the scientific research are threatened. Therefore have to change their agendas to maintain support and still resist whaling for other reasons such as ethics and agendas.

Cultural and ethical views of scientific whaling

Whaling has increased in the publicity since mankind noted the decline in the mega fauna and the magnificence human kind see in the largest mammal on the planet. Since then animal rights and welfare groups such as Greenpeace and the Sea Sheppard's have been making the public aware of whaling in the Southern Ocean. The major impact these type of groups want to project is the needless killing of whales and that it is impacting our ecosystems. It is known the number of whales removed is sustainable for the minke population in the Southern Ocean, therefore the conservationists protesting whaling cannot protest for that reason. Instead it emphasises the special ideal humans put on whales that they need to be protected and not killed because mankind appreciates them, and again a lot of uncertainty of the practices and information coming from the scientific whaling programme (Clapham et al., 2007).

Japan on the other hand has a long cultural heritage of the consumption and hunting of whales (Kasuya 2007). If any nation was to begin scientific whaling research and be accepted by their population it would be one with a history of whaling. For example New Zealand have taken an environmental stance on whaling there is considerable pressure from the population to maintain this stance and any political agendas against this and for whaling would be thrown out immediately as it is not accepted in the Western societies. It is however of concern how strongly they hold onto the ideals of whaling with such great opposition and little negotiation space around it (Clapham et al., 2007).

The Future of scientific research whaling

With everyone voicing their opinions on whaling there is very little done to proactively address it, not with conservational acts but with true scientific evidence that is able to sway nations and provide scientific certainty where there was none to begin with. If other nations are truly concerned about the sustainability of the whales then research should be carried out by those nations and NGOs through other techniques that fit in with their culture and ethics as described in this review. Samples and data could then be compared across the different techniques. This is definitely an area for future study if the concern they vocalise is one they are willing to put into action and therefore not only stop preventing study but enhance it, this is a case of putting your money and resources where your mouth is. In particular studies on life history parameters of whales is of great interest to make well informed demographic models to be used in management (Baker & Clapham 2004). Hopes for the future that are more in line with the anti-whaling agenda or may possibly found a middle ground include science offering information on all the threats the whales may face, protective measures that continue to allow stock recovery and the development of these alternative and non-lethal data collection (Leaper & Miller 2011).

Even if research does lead to the evidence of sustainability it is a long road to the removal or adjustments of the moratorium due to the number of anti-whaling nations.

Japan are a whaling nation and therefore there is no cultural or ethical backlash to whaling for research or for food. As already noted there is whale meal continually being sold in the Japanese markets (Baker et al., 2010) and therefore if commercial whaling to again be opened with the moratorium lifted then it would be of economic gain to whale again. It must be noted that all of this protest to whaling is under the same reasoning that the whaling moratorium and the scientific whaling research being carried out today, there is no scientific certainty and therefore action is taken in the way of precautionary measures (Heazle 2004).With an ever increasing human population and declining fish stocks due to human exploitation and not the feeding of whales (Clapham et al., 2007) it is likely food supplies will have to come from alternative sources.

Conclusion

There is significant evidence for the need to address the whaling issue as having multiple agendas for the Japanese government. With technological bounds and increasing concern for the whale populations in the Southern Ocean the next logical step is to continue more comparable scientific research to put the uncertainty in the research and incentives of Japan to rest. More information is needed to make management decisions best for the ecosystem. The future of the scientific whaling research depends on the strength and actions of whaling oppositions through scientific proof and if all of the agendas Japan are believed to have can be proven or dismissed.

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